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Cover: The end of a battle between two Sonoran Desert Tortoises (*Gopherus morafkai*). Photograph by Roger A. Repp, Pima County, Arizona—where the turtles are strong!

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A Herpetologist and a President: Raymond L. Ditmars and Theodore Roosevelt

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Raymond L. Ditmars, the best-known herpetologist of the first half of the 20th century, left this earth 75 years ago this month, on May 12. I will use this sad anniversary to at last discuss something more positive: a fascinating friendship. I first learned of it in 1994 and the Chicago Herpetological Society deserves much of the credit!

As I have written several times previously, I have great admiration for Archie Carr (Novotny, 1995, 1998). The CHS scheduled his most notable protégé, Peter C. H. Pritchard, to speak on September 28, 1994. His topic: "The Diversity, Natural History and Conservation of the Tortoises of the World." I faced an October 1 "use or lose" vacation deadline and splurged on an overnight trip to your Windy City. I would not be surprised if the lodging cost more than round trip from Cleveland to O'Hare (only $60 or so). It turned out that Dr. Pritchard and I used the same hotel, and Mike Dloogatch transported us there after the program.

In addition to the site of the CHS meeting, your magnificent Field Museum, I visited the Shedd Aquarium and the Adler Planetarium and walked your lakefront. In a used bookstore whose name escapes me I stumbled upon *Theodore Roosevelt: The Naturalist* by Paul Russell Cutright[1]. It has since became a treasured volume in my library. What immediately caught my attention: Dr. Cutright quotes a 1907 letter from TR to RLD that praises *The Reptile Book* and then suggests the president's missive encouraged the herpetologist to eventually produce his succession of popular books such as the now classic *Thrills of a Naturalist's Quest*. Wow! I had long known about TR's passion for the outdoors, hunting, and park preservation, but reptiles too?

I discovered L. N. Wood's[2] 1944 Ditmars biography in high school. A close re-reading makes no mention of this letter but describes TR as RLD's "friend since the appearance of *The Reptile Book*" (p. 148). In *Bushmaster*, published in 2015 (and soon to be available in paperback—June 27, a week after the 141st anniversary of RLD's birth) Dan Eatherley[3] echoes my lament that virtually no primary materials of RLD's legacy survive, including the "famous 1907 letter from Theodore Roosevelt congratulating Ditmars on *The Reptile Book*" (p. 275). In his excellent new TR biography, *The Naturalist*, Darrin Lunde discusses TR's friendships with many prominent naturalists and how he encouraged them to write. Unfortunately, he does not mention RLD at all.

Thankfully, the letter does survive in the Library of Congress and on microfilm in the Theodore Roosevelt Collection at Harvard University's Houghton Library. I owe my gratitude to curators Wallace Dailey and Heather Cole. Mr. Dailey twice mailed hard copies in 1999 and 2007, my first two "good intentions" to create this piece. Ms. Cole e-mailed a pdf just recently. I thought you'd like to read it for yourselves 110 years later. I've transcribed it below and annotated a bit as I did on another Ditmars article published here (Novotny, 1999). Because I began this article with no time to spare, in order to make the May issue, I had to rely on Wikipedia.

I had also hoped to include Cameron Mann's complimentary review of *The Reptile Book* in the May 4, 1907, *New York Times*, but could not figure out how to obtain permission. I accessed this review via our public library's research databases <http://www.nytimes.com/ref/membercenter/nytarchive.html> using these keywords in my successful search: 1907, reptile, book, Raymond.

§§§§§§§§§§

Personal

Oyster Bay, N.Y.,[4]
July 1, 1907.

My dear Dr. Ditmars:

In these days of nature fakers, when even a paper like The Outlook can curiously back up a creature like Long[5], it is genuinely refreshing to come upon a book like yours, I have a very strong belief in having books which shall be understood by the multitude, and which yet shall be true—in other words, scientific books written for laymen who have some appreciation of science—so that the books will be of value to all men who are interested in the subject. It seems to me that your volume exactly fulfills these requirements. Personally I have long wanted to have in my library a good book on reptiles.

---

[1] Paul Russell Cutright (1897–1988). A native of the Mountain State. Earned Bachelors and Masters from West Virginia University, Doctorate from University of Pittsburgh. Taught only in the Keystone State: Pitt., Geneva College, and Beaver College (now Arcadia University according to Wikipedia). Authored a half-dozen books, including another about Roosevelt and two about Lewis & Clark. My reading stack just grew higher!

[2] Laura Newbold Wood Roper (1911–2003) was a native of St. Louis and a graduate of Vassar in Poughkeepsie, New York. According to the Library of Congress, her Ditmars book was also published in German in Berlin (1949). She authored similar biographies for young readers about Walter Reed (1943) and Louis Pasteur (1948). Mrs. Roper used a scholarly approach in her 1974 acclaimed biography of Frederick Law Olmsted. The Laura Wood Roper Papers in the Library of Congress relate to that final book. She and I corresponded in 1999–2000. What a disappointment to learn that she discarded the resource material used in the Ditmars biography.

[3] See <www.daneatherley.com> for a great deal of information and many *Bushmaster* reviews including those written in 2015 by Stephen Barten, DVM, in the CHS *Bulletin* 50(7):101-102 and Ray Novotny in *Herpetological Review* 46(4):159-161..

My only complaint is that you have not written as fully as you certainly could about the great number of interesting experiences that must have come to your knowledge. Take that big sea-turtle[6] that was killed by the crocodile or alligator. How did it happen? Did the crocodile bite thru its shell? Under what circumstances was the attack made? So with the king snake[7]. Have you actual instances where they have killed rattlesnakes such as the Florida diamond-back rattlesnake, where the rattlesnake was as big as the kingsnake?

It would be a great pleasure if I could see you some time.

Sincerely yours,

(no signature in archived letter)

§§§§§§§§§§

Ditmars' reply:

July 10th, 1907

Honorable Theodore Roosevelt,
President of the United States
Oyster Bay, Long Island.

Dear Mr. President:—

Your very kind letter relating to The Reptile Book awaited me upon returning from a vacation trip. I heartily appreciate your suggestions and would feel rather guilty about my concise methods in treating habits were it not for the fact that The Reptile Book was primarily intended to be a work for the purpose of identification—but during compilation it occurred to me to present a resumé, here and there, involving the habits of our more important reptiles. This idea gathered force until I found my MS. growing alarmingly in volume—and it was suggested that if the work were to be sold at a reasonable figure, there must be a limit. I spent some time in thus condensing the original MS. Now, I am working on a more general book[8] about Reptiles and in this the habits are treated quite elaborately.

Regarding your queries would explain:—That sea turtle was badly lacerated about the neck by the jaws of a five-foot crocodile. The crocodile was excited owing to the keeper throwing food into the tank—the reptile, scenting the fragments of fish, was swimming about, snapping blindly. Regarding our native King Snake would say that I have watched a specimen kill a poisonous moccasin that was considerably longer than the former and over twice its diameter. I have no field notes regarding attacks upon big rattlesnakes, though I have no doubt that a fair-sized rattler would share the same fate as the moccasin if it should cross the King Snake's path and be disposed to tarry. I have often observed the King Snake to kill and eat specimens of the Ground Rattlesnake, Sistrurus miliarius—Pigmy Rattlesnake—a species attaining a length of about two feet. However, it should be understood that the King Snake does not especially seek out the dangerous serpents, although it may be found in localities where venomous snakes are particularly abundant—a fact that may be significant. It is also interesting to note that the King Snake appears to be quite immune to snake poison, while the greater number of harmless serpents quickly succumb to the action of the virus.

Let me thank you again for your kind letter. I shall look forward to meeting you some day for a chat upon reptiles.

Very sincerely yours,

§§§§§§§§§§

TR's endeavors with another famed naturalist, John Muir (1838–1914), are well documented (Fox, 1981; Turner, 1985). Unfortunately, we will probably never know anything more about the relationship between the herpetologist and the president. For certain, they shared a Dutch ancestry, a New York residence, passion for natural history, love of adventure, prominence in society, and skills at communicating with the world. Both of their lives were far too short but their legacies endure.

With the possible exception of Thomas Jefferson (Patton, 1919; Thomson, 2008), TR is the only U.S. president with a deep interest in the natural world. In his preface, Cutright (1956: p. vii) states:

> The period of Roosevelt's residence in the White House, and the years immediately following, were marked by a definite upsurge in scientific thought, investigation, publication, and reevaluation of obsolescent ideas.

How times change . . . witness the "March for Science" held on Earth Day in many communities across our globe.

Postscript

The 1994 trip was my first and only time in Chicago. Of course I've been in your airports since, including a 2013 overnight in a motel somewhere near Midway courtesy of Southwest Airlines. Great city you have but I'm still hurting about the

---

[4] Several jurisdictions/features on Long Island are named Oyster Bay. One of them is a "hamlet" near the Village of Cove Neck in Nassau County on the north shore of L.I. TR built a home at Cove Neck in 1886 and used it as his primary residence until his death in 1919 (Wikipedia). The National Park Service has operated the home as Sagamore Hill National Historic Site since 1962. Oyster Bay is the mailing address and probably was in 1907.

[5] According to Wikipedia "nature fakers" were early 20th century writers accused of extreme anthropomorphism about the habits of animals. *The Outlook* was a popular weekly under various names from 1870 until 1935. Roosevelt was an outspoken critic of the practice and especially of one of the main authors, William Joseph Long (1866–1952). One of the best references about this controversy is Lutts (1990).

[6] Ditmars purchased a 45-pound Green Turtle, *Chelonia mydas*, presumably at a local fish market. He kept it in an 8 × 10' tank of "manufactured sea water." *The Reptile Book*, p. 9.

[7] "Habits of the King Snake." *The Reptile Book*, pp. 360-363.

[8] Likely his *Reptiles of the World*, first published in 1910.

Cleveland Indians loss in last year's World Series. And losing Cleveland-area native QB Mitch Trubisky to the Bears in the 2017 NFL draft rubbed salt into that wound.

For me, writing is a solitary labor of love but I always wonder if it's worth the effort. Does anyone read my contributions? If you've read this far, please let me know via e-mail.

Addendum

In his 1997 memoir, Roger Conant (p. 459) reminisced that it was quite a few years before he could afford the price of a secondhand personal copy of *The Reptile Book*. Indeed, Ditmars (1936: p. xii) reported it had gone out of print prior to 1930 and the price for used copies had increased fivefold (see numbers below). One of my few successes in the SSAR auction of RC's library was this title. How I hope I won this specific copy! I used it for this article and especially like that it's the 1922 printing, the year of my father's birth.

The original 1907 list price was $4. According to www.in2013dollars.com, $4 in 1907 would be $93.49 in April 2012, when I purchased it at auction for $29.95.

I am not proud to admit that my "archives" are not as well curated as Harvard's etc. (Witness my requesting the same TR-RLD letter thrice!). Somewhere, I have a copy of a letter, courtesy of the American Museum of Natural History, from RLD's publisher inviting RC to revise one of RLD's books, either *The Reptiles of North America* (1936, the successor to *The Reptile Book*) or *Reptiles of the World* (1910). Surprising to me, RC declined the opportunity.

While Mike Dloogatch and I were working on this piece, he alerted me to a paper about Florida turtles by TR that I had long forgotten. I hope you enjoy this this gem from Archie Carr as much as I do (1952: p. 334):

> Theodore Roosevelt (1917) made the statement that gophers [tortoises] reach a shell length of 18 inches (458 mm); but when he said in the next breath that a 13-inch individual "easily walked away" with him standing on its back, having some vague recollection of the size of the President I lost confidence in the whole yarn.

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Notes on the Herpetofauna of Western Mexico 16: A New Food Item for the Striped Road Guarder, *Conophis vittatus* (W. C. H. Peters, 1860)

Daniel Cruz-Sáenz[1]*, David Lazcano[2] and Bryan Navarro-Velazquez[2]

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Abstract

We document for the first time predation on *Aspidoscelis communis* by *Conophis vittatus*. The snake was observed 1 September 2016 at 12:02 h in the municipality of Cuauhtémoc, Colima, Mexico, 500 m northwest of the national airport of the city of Colima. It was active in grassland close to the airport, which still harbors patches of medium deciduous tropical forest. The snake measured 480 mm snout–vent length and 220 mm tail length, a total length of 700 mm.

Resumen

Documentamos por primera vez la depredación de un *Aspidoscelis communis* por un *Conophis vittatus*. La serpiente fue observada el 1 de Septiembre de 2016 a las 12:02 h en el municipio de Cuauhtémoc, Colima, México; a 500 m al noroeste del aeropuerto nacional de la cuidad de Colima. Estaba activo en pastizal cerca del aeropuerto, el área todavía conserva parches de bosque tropical mediano caducifolio. Las mediciones morfométricas de serpiente fueron 480 mm LHC, longitud de la cola 220 mm, y con una longitud total de 700 mm.

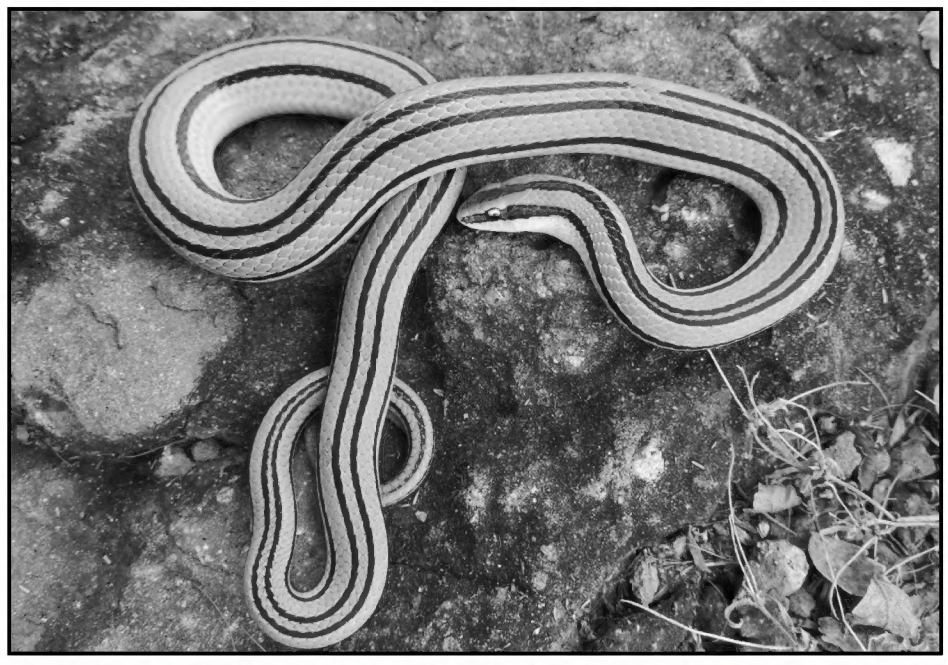
Introduction

This finding was made when visiting the city of Colima. We were called by a friend who was observing the snake eating the lizard on the premises of the national airport of Colima, Mexico. When we arrived, we took the reported data.

Background: *Conophis vittatus*

The striped road guarder, *Conophis vittatus*, has been recorded in Mexico along the Pacific plain from Nayarit to Chiapas and in the Balsas Basin. It is also found in northern Jalisco, central Guerrero, northeastern Oaxaca, and central Chiapas. (Ramírez-Bautista, 1994; García and Ceballos, 1994).

A member of the family Dipsadidae, this is a medium-sized sspecies (snout–vent length up to 668 mm). The dorsal color is light brown with three dark lines from snout tip to the neck then four lines running the length of the body. The belly is light-colored. It is diurnal, terrestrial, oviparous, and carnivorous. It can be distinguished from *Salvadora mexicana* and *Symphimus leucostomus* by the head and body color, and from *Rhadinaea hesperia* by the number of longitudinal lines on the body (García and Ceballos, 1994). Like many other snake species, it has been reported to display death-feigning (thanatosis) as a defensive behavior (Gehlbach, 1970; Mirza et al., 2011; Ahumada-Carrillo, 2013). It is a very common species, with no known economic importance (García and Ceballos, 1994). Its elevational range extends from sea level to about 1100 m (Flores-Villela et al., 2010). It inhabits tropical deciduous forest and xerophilous scrub, where it is found on the ground. (García and Ceballos, 1994).



Striped road guarder, *Conophis vittatus*. Photograph by Israel Solana-Zavaleta.

Members of the genus *Conophis* feed primarily on lizards (Savage, 2002). Lizards reported as prey include members of the genus *Aspidoscelis* (Wellman, 1963; Greding, 1972) and *Holcosus undulatus* (as *Ameiva undulata*; Madrid and Cifuentes, 2012). Other diet items reported include frogs, toads, snakes, and small mammals (García and Ceballos, 1994), and arthropods and snake eggs, (Stafford and Henderson, 2016).

Conophis vittatus is not listed in the Mexican legislation Norma 059 (SEMARNAT, 2010). The IUCN (2007) lists it as an endemic species for Mexico, and places it in the category of Least Concern.

Background: *Aspidoscelis communis*

Aspidoscelis communis is endemic to Mexico and has been recorded along the Pacific coast from Jalisco to Michoacán (García and Ceballos, 1994; Noguera et al., 2002; Santiago-Pérez et al., 2012).

This is a large lizard with a snout–vent lentgh of up to 155 mm. The back is generally brown with a shifting color pattern depending on age; juveniles have yellow lines, subadults have yellow lines and rows with yellow spots, and adults have rows of spots. The head is triangular with a different color from the rest of the body with the presence of large and small scales, the

Aspidoscelis communis. Photograph by Israel Solana-Zavaleta.

Aspidoscelis communis. Photograph by Israel Solana-Zavaleta.

belly is light-colored with large scales. The tail is long, not very thick, but strong, with quadrangular scales usually red in color (Uribe-Peña et al., 1999). Males develop a typical breeding coloration during the rainy season (Pardo de la Rosa, 2001) consisting of a light blue belly with many light areas and a white throat, that can have small blue zones (García and Ceballos, 1994; Noguera et al., 2002; Santiago-Pérez et al., 2012). Its diet is mainly termites, lepidopteran larvae and orthopterans (Pardo de la Rosa, 2001).

This lizard inhabits tropical deciduous and tropical semideciduous forests and xerophilous scrub (García and Ceballos, 1994; Santiago-Pérez et al., 2012) throughout its distribution.

Mexican legislation Norma 059 (SEMARNAT, 2010) lists the species as endemic to Mexico and categorizes it as in need of special protection (Pr); the IUCN (2007) places it in the category of Least Concern.

Background: Colima and its Herpetofauna

The state of Colima is situated in southwestern Mexico, between latitudes 19°31′ and 18°41′ N and between longitudes 103°29′ and 104°35′ W. It is the 28th state in size with an area of 5191 km^2 and represents less than 0.3% of Mexico's total surface area (Báez-Montes, 2016a). It is politically divided into 10 municipalities: Armería, Colima, Cómala, Coquimatlán, Cuauhtémoc, Ixlahuacán, Manzanillo, Minatitlán, Tecomán and Villa Alvarado.

Some of the highest elevations in the state are: Nevado de Colima (= Volcán de Fuego de Colima), at 3820 m, Sierra de Manantlán at 2420 m, Cerro Grande at 2200 m, and Cerro El Peon at 2014 m. Geologically, Colima consists of the Neovolcánico Chain (18%), and the Sierra Madre del Sur (82%). The climate in Colima is mostly hot and subhumid (86%, except in mountainous areas above 1000 m).

The annual average temperature is 25°C. The rains appear during the summer, with total annual rainfall approximately 900 mm. The state's population is 711,235 (INEGI, 2015; Báez-Montes, 2016).

Fourteen life-zones are recognized in Colima: deciduous low tropical forest, deciduous high tropical forest or medium, low thorny evergreen forest, pine-oak forest, pine forest, oak forest, cloud forest, savannah, palm groves, mangrove, carrizal-tular, floating vegetation, grassland, and thorn scrub (Arévalo et al., 2016). The flora of the state is well studied, with 7500 species recorded and an endemism rate of only 1%. The state has four protected areas: 1) Reserva de la Biosfera Sierra de Manantlán; 2) Parque Nacional Nevado de Colima, Áreas de Protección Forestal y Refugio de la Fauna Silvestre; 3) El Jabalí; 4) Las Huertas (CONANP, 2015; García et al., 2016).

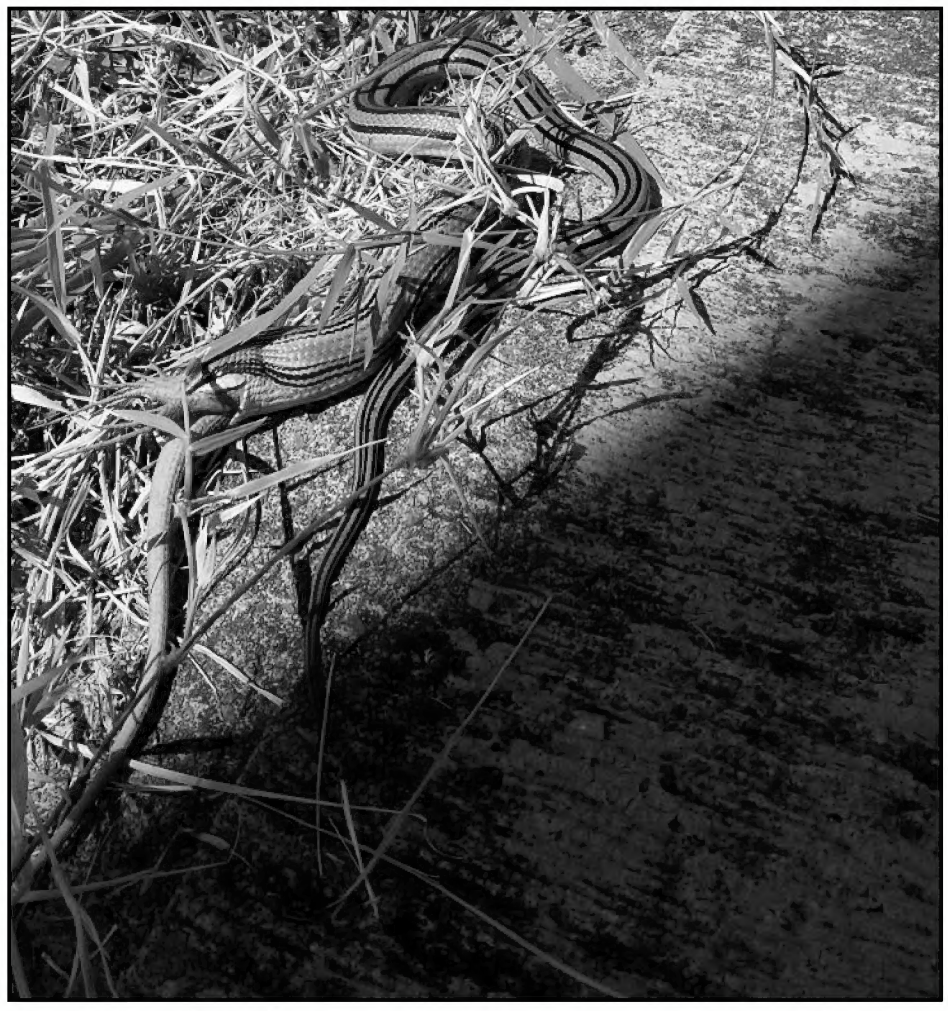
According to the national forest inventory (INEGI, 1997), the state contains representatives of seven of the most important plant communities of Mexico (Rzedowski, 1978; Palacio-Prieto et al., 2000). In addition, nearly half of its territory lies within the deciduous tropical forest community, which is part of one of the most biologically valuable ecoregions of our planet (Eco-region 56: Olson and Dinerstein, 1998). The great importance of the floristic diversity of Colima has been recognized by protecting territory under federal law (Region Prioritaria Terrestre Manantlan-Volcán de Colima) (Arriaga et al., 2000, Báez-Montes, 2016b).

Unfortunately, Colima has a very high rate of deforestation. By 1992 up to 25% of its territory had been deforested (Flores-Villela and Gerez, 1994). Based on Palacio-Prieto et al., (2000), 42.6% of the state's surface is now occupied by land devoted to agriculture and human settlements.

The most recent compilation of Colima's herpetofauna recorded 152 species: 117 reptile species and 35 amphibian species (Garcia et al., 2016). The 152 herpetological species in the state herpetofauna represent 13% of the national total (1165), corresponding to 15 % of reptiles and 10 % of amphibians (Flores-Villela and Marquez, 2004; Ochoa-Ochoa and Flores-Villela, 2006). In Colima there are 80 endemic species, equivalent to 12% of the national total reported by Ochoa-Ochoa and Flores-Villela (2006).

Among amphibians, the most diverse families in the state are Bufonidae (5 species), Eleutherodactylidae (8), Hylidae (11), and Ranidae (4), while the most diverse genera are *Craugastor* (4), *Lithobates* (4), *Ollotis* (3) and *Syrrhophus* (4) (García et al., 2016).

Family diversity for reptiles in the state stands as follows: Phrynosomatidae (14 species), Teiidae (6 species), Colubridae (26 species), Xenodontinae (19 species), and Viperidae (8

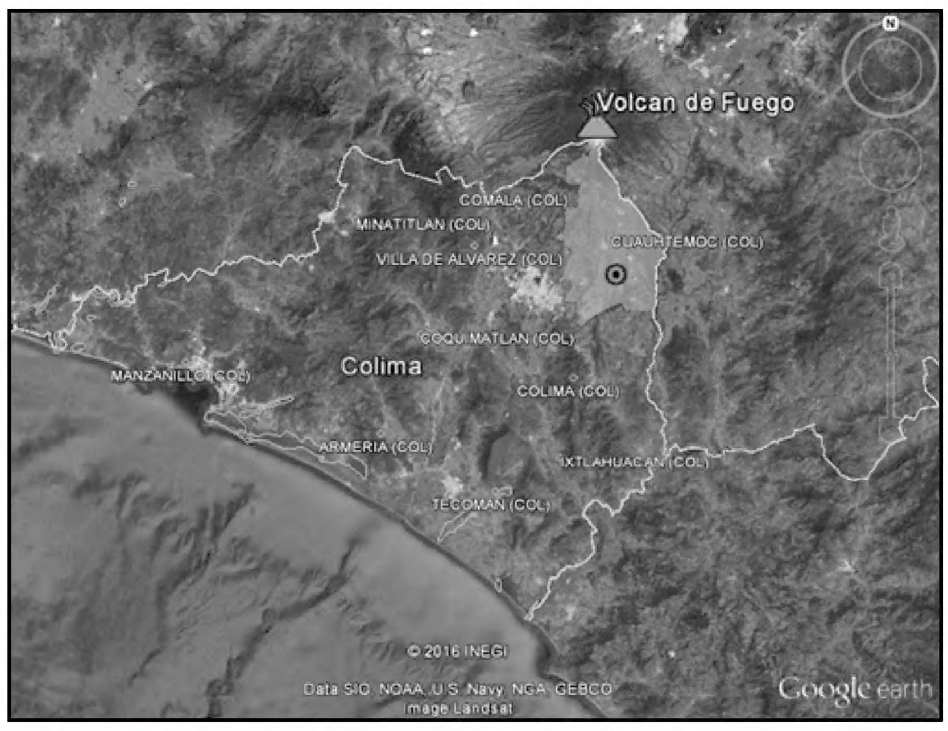


A striped road guarder, *Conophis vittatus*, consuming an *Aspidoscelis communis* in the state of Colima, Mexico. Photograph by José Concepción-Carrillo.

species), with the most diverse genera being *Aspidoscelis* (5 species), *Sceloporus* (10 species), and *Crotalus* (6 species).

Results

We document for the first time predation on *Aspidoscelis communis* by a *Conophis vittatus*. The snake was found 1 September 2016 at 12:02 hrs. in the municipality of Cuauhtémoc, Colima, Mexico, 500 m northwest of the national airport of Colima (13Q 649082 E 2132746 N, datum WGS 84. elevation 770 masl). It was active in grassland close to the airport, in an area that still supports patches of deciduous medium tropical forest. The surrounding area is now grassland used for grazing. The snake was 480 mm snout–vent length, with tail length 220 mm, for a total length of 700 mm. No measurements of the prey were taken. The event lasted 8 minutes.



Bull's-eye indicates the location where the predation event was observed in the municipality of Cuauhtémoc, Colima, Mexico.

Discussion

Predation is a major selective force in the evolution of morphological characteristics of organisms (Edmunds, 1974; Endler, 1986). Predation events are difficult to record in the natural environment (Shepard, 2007). Such events have been documented frequently in *Herpetological Review* in its Natural History Notes. Recently, the electronic journal *Mesoamerican Herpetology* has focused on the same type of events, stressing the importance of documenting natural history events.

The genus *Aspidoscelis* is a food source for many vertebrates (foxes, hawks, kestrels, roadrunners, collared lizards, leopard lizards, other whiptails, and snakes in desert areas) and invertebrates (Jones and Lovich, 2009). Some recent examples that have been documented for the genus are as follows: García-Vazquez et al. (2012) documented a male striped whipsnake (*Coluber taeniatus*) preying on an individual Cuatrocienegas whiptail (*Aspidoscelis inornata cienegae*) at the Cuatrocienegas Basin, Coahuila; Reynolds and Gebhard (2014) documented finding in the stomach contents of an adult turkey vulture (*Cathartes aura*) a male black-bellied racerunner (*Aspidoscelis deppii*) in El Salvador.

A problem documented in Marias Islands in western Mexico (Ortiz-Alcaraz, 2007; Ortiz-Alcaraz et al., 2008; Bonnaud et al., 2011) is the Isla Marias whiptail (*Aspidoscelis communis mariarum*) preyed on by feral cats (*Felis catus*) that is significantly reducing populations not just of this species but of all that they can prey on the islands, resulting in the worst case the complete extinction of species (Vitousek et al., 1996; Leung et al., 2002, Courchamp et al., 2003).

In 1987, when the herpetological laboratory at UANL was a small natural history museum, we had many snakes in captivity, which were used for exhibition for the visiting public (normally school children). An adult *Lampropeltis annulata*, after inhabiting the premises of our building for nearly 2 years, escaped. One day people who were playing baseball in a nearby field found it and reported the finding to us. While we were handling it, it regurgitated an adult *Aspidoscelis gularis*, many of which at that time could be found active on very hot days in the summer on the university campus. Today, because of the expanding of our university building and the presence of feral cats, they are not found anymore.

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Some Unreported Trematodes from Wisconsin Leopard Frogs

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Recently, I compiled and summarized published information on parasites and disease-causing organisms reported from Wisconsin amphibians and reptiles (Watermolen, 2014). I found trematodes (Platyhelminthes: Trematoda) were the most frequently reported parasites of amphibians, with at least 15 species having been recorded from northern leopard frogs (*Rana pipiens*) collected in the state. I also noted that there is much yet to be learned about these organisms and that the compilation served only as a preliminary step in documenting the diversity of parasites present in the region. As such, it is not surprising that more recent reviews of the collections databases from several natural history museums have yielded previously unreported records of trematodes from Wisconsin leopard frogs. I report these here to supplement the earlier compilation:

Cephalogonimus americanus Stafford, 1902—The Harold W. Manter Laboratory of Parasitology at the University of Nebraska has a slide-mounted specimen (no. 21941) taken from the intestine of a Wisconsin leopard frog. The only other previous Wisconsin records for this genus are unidentified *Cephalogonimus* sp. from leopard frogs (Williams and Taft 1980) and *C. salamandrus* from green frogs (*R. clamitans*) and tiger salamanders (*Ambystoma tigrinum*) (Coggins and Sajdak 1982). *C. americanus* has been reported from green frogs and leopard frogs in neighboring Michigan (Muzzall 2005).

Clinostomum attenuatum Cort, 1913—The U.S. National Museum's National Parasite Collection and Harvard University's Museum of Comparative Zoology contain specimens (nos. 1332547 and 138183, respectively) collected "from subcutaneous cysts" in leopard frogs taken at Oshkosh, Wisconsin on 10 November 1930. Cort (1913) described *C. attenuatum* based on metacercariae (larval forms) from leopard frogs apparently collected in Illinois, although he briefly mentioned specimens provided to him "From cysts in frog, Oshkosh, Wisconsin." The only other previous Wisconsin record for this genus in amphibians is from Yoder et al. (2001) who reported unidentified *Clinostomum* sp. from the body cavity of green frogs. Ulmer (1970) and Muzzall (2005) reported *C. attenuatum* from leopard frogs in Iowa and Michigan, respectively.

Haematoloechus breviplexus Stafford, 1902—The Manter Laboratory has a slide-mounted specimen (no. 1081) taken from a Wisconsin leopard frog. This trematode has not been reported from Wisconsin previously (Watermolen, 2014), but is known to parasitize green frogs and mink frogs (*R. septentrionalis*) in neighboring states (Muzzall, 2005; Schotthoefer et al., 2009).

Haematoloechus longiplexus (Stafford, 1902)—The U.S. National Museum collection includes specimens (no. 1350580) collected from leopard frogs in Dane County, Wisconsin. *H. longiplexus* rarely infects leopard frogs in nature (e.g., in <1% of *R. pipiens* specimens compared to 24–58% of bullfrogs, *R. catesbeiana*, collected in Nebraska) (Brooks, 1976; Snyder, 1996; Bolek and Janovy, 2007a, b). The only other previous Wisconsin records for *H. longiplexus* are from Williams and Taft (1980) who reported finding this species in green frogs. Ulmer (1970) reported *H. longiplexus* from bullfrogs and leopard frogs in Iowa, and Muzzall (2005) reported it from Michigan bullfrogs and green frogs.

Loxogenes arcanum (Nickerson, 1900) Stafford, 1905—The Manter Laboratory has a slide-mounted specimen (no. 23706) taken from the intestine of a Wisconsin leopard frog. Williams and Taft (1980) previously reported this trematode from Wisconsin green frogs and it known to parasitize other *Rana* spp. (Bouchard, 1951; McAlpine, 1997; Muzzall, 2005; Schotthoefer et al., 2009).

The accumulation of knowledge is a gradual process. The above records add to our understanding of the composition of the regional parasite fauna. Additional field investigations, further exploration of museum collections, and confirmation of specimen identifications will be necessary to form a more complete picture. Such work can provide a foundation for better understanding the relationships these organisms have with their amphibian hosts.

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What You Missed at the April Meeting

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Citizen science is getting much attention lately. And why not? Crowd sourcing can provide masses of data that otherwise would be impossible to collect. From astronomy to geology to biology, scientists are setting up easy-to-use apps that can record a person's finding and enter it in a database accessible to those who can put it to use. Anyone with a cell phone can use HerpMapper (herpmapper.org) or iNaturalist (inaturalist.org) to record the herps they find in the field, and they should. It's a little extra work that can significantly help those who are studying these animals. For details on HerpMapper refer to Bull. Chicago Herp. Soc. 50(7):107-108, 2015.

Gerry Salmon. Photograph by Dick Buchholz.

But always there are those who are not satisfied with merely recording their finds. Some people take the concept of amateur scientist beyond the condescending connotation of a untrained, unprepared, and wrong thinking hobbyist and bring back the original definition of an amateur scientist to mean simply someone who is not paid. History has a long list of valuable contributions made by amateur scientists, and that list continues to grow thanks to people such as Gerry Salmon.

I know that name seems familiar to regular readers. April's talk was not the first time that Gerry has presented to the CHS, and I hope it won't be the last. Gerry is an amateur scientist in the best sense. He has a continuing interest in exploring many herp-related areas and his presentations are always fresh and engaging. This time we were treated to his studies on copperheads. The title was "Prey Selection in Western Copperheads (*Agkistrodon laticinctus*) – Applications for Captive Management."

Gerry is now in his sixth year of researching western copperheads with Dr. Harry Greene as the lead researcher. It has to be easier to carry on a research project with the likes of Dr. Greene as collaborator.

His presentation began with a beautiful picture of a western copperhead on the title slide and a quick taxonomic lesson that now has copperheads divided into two species with the western encompassing the former subspecies of broad-banded and trans-Pecos. Gerry wanted to look at the western because they have not been studied as much as eastern copperheads. Westerns are generally smaller than easterns and while they do not keep the bright tail color of a juvenile, they do keep a contrasting color that the adults have been observed using as a caudal lure.

Copperheads are highly evolved pit vipers with all the characteristics of an ambush predator, but the data so far shows the snake to be much more of a generalist feeder than one might expect. Gerry included a radiograph of a snake that had swallowed a horned lizard being radio tracked. Call me gruesome, but I always think it's cool to see a transmitter-equipped animal inside the stomach of a predator. I doubt that the horned lizard researchers felt the same. The snakes were taking different prey at different times of the year and the study hopes to determine if diet is coincidental to the availability of prey or if the snakes are actively seeking out the prey depending on the time of year. Gathering data is the focus, and Gerry has collected published and unpublished observations as well as actually examining the stomach contents of copperheads in museum collections. Working with Dr. Greene probably facilitated access to the collec-

Typical habitat of copperheads at Independence Creek. Leaf litter can be very deep in these areas. Photograph by Gerry Salmon.

Sometimes it's easy to identify the stomach contents. A copperhead favorite: cicada nymphs. Photograph by Gerry Salmon.

tions, especially since the exams are invasive.

I have a soft spot for museum collections, especially biological collections, and I have written about them before, but Gerry's study makes a strong case for their importance. A particular collection gave his study important answers and generated interesting questions, so Gerry gave us a little background on the Independence Creek collection of the University of Texas, Austin.

In the years 1948–1950 students of Dr. W. Frank Blair at UT Austin were sent on a concentrated sampling effort to Independence Creek, a river in West Texas about six miles long fed by several springs. In that area copperheads follow the riparian habitats, avoiding the dryer areas and staying near water. In a short period from late June to early July of 1949 the students collected 94 copperheads from the Independence Creek area. One of the students wrote it was " . . . one of the greatest aggregations of poisonous snakes ever recorded outside a den." Gerry said that one " . . . could really argue that this was an over-collection," but it is an important resource. Sixty years later Gerry and Dr. Greene would begin to unravel the whys behind that congregation.

A treasure trove of information. One of the UT Austin collection jars from 1949. Photograph by Gerry Salmon.

Gerry took us through a little of what it takes to discover the stomach contents of museum specimens. Under the tutelage of Dr. Greene he learned to tell if a specimen had something in its stomach, to carefully slit the ventral surface of the specimens to minimize damage, and to open the stomach, record the contents, and label and preserve the results so that they might be used in future research. Sometimes the prey was easy to identify and sometimes experts would be consulted. Gerry had a nice set of slides that illustrated the process, followed by slides showing some of the prey items discovered.

The results of the study so far have revealed cicadas as the most common prey item of the western copperheads, followed by caterpillars. Gerry expected to find frogs a major portion of the diet, but only one frog was found. Mammals are usually a major component of pit viper diets but were not common. Indeed, no mice were discovered, but some bats and shrews were recorded.

As important as it is to determine what the snakes eat, Gerry wants to pursue another question. Are the snakes reacting to

Juvenile western copperheads relished any caterpillar. Photograph by Gerry Salmon.

A stretch of road that frequently yields copperheads even though the best habitat is far away. Are they looking for the caterpillars along the highway shoulders? Photograph by Gerry Salmon.

Copperheads are found in the canyons and riparian habitats. Photograph by Gerry Salmon.

where and when food is available? The study is trying to deter mine if the snakes seek out areas they know will likely have food items at a particular time. The Independence Creek event might be the result of snakes responding to a large emergence of periodic cicadas. The snakes would have traveled to the area to take advantage of the resource. Gerry has data on copperheads found far from their normal habitat where the only attraction seems to be caterpillars inhabiting particularly lush strips of grasses growing along a highway through arid land not likely to be home to the snakes. He admits that the question is far from answered.

Gerry wanted more info on feeding habits of copperheads. Often reluctant feeders in captivity, Gerry wanted to find out what prey triggered the most intense feeding response. He brought gravid females into captivity and used the naïve offspring as test subjects as well as testing wild-caught specimens. We had an interesting time viewing the results on his slides. For northern copperheads red-backed salamanders (*Plethodon cinereus*) brought the greatest reaction. For westerns caterpillars seemed to elicit the strongest response. He showed us photos of naïve juveniles quickly consuming even hairy caterpillars. While small snakes were consumed with nearly as much relish, frogs were ignored even when frog and snake were isolated in small containers. He had a series of photos showing how a copperhead typically goes through a "sizing up" routine before it swallows a mouse, moving from the head to the tail and back on both sides of the mouse before eating it. Cicadas, especially the nymphs, were always consumed eagerly.

As in most of science, the more information we have the more questions we seem to generate. Gerry is obviously not done with any of his studies and will continue to pursue knowledge in the field, in laboratories, and in his home. All of us are not so dedicated, but you can help with gathering data and preserving it. Try out some citizen science apps. Support your local natural history museum and its collections. Few of us will contribute as much as Gerry Salmon, but we all can contribute something.

Small snakes, such as this *Tantilla gracilis*, were eagerly taken by snakes that had never before seen one. Photograph by Gerry Salmon.

These are northern (now eastern) copperheads (*Agkistrodon contortrix*) that Gerry was studying in 2004. The babies were born in August of that year and individually separated from their mother to test food preferences. Nearly three months later he put all of the snakes into the same cage and this resulted. It's just a cool photograph by Gerry Salmon.

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Gung-ho for GOMO

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The preparation phase for this particular column led me to a file cabinet drawer that had not been opened in over 15 years. Said drawer contains endless files of raw data on the tortoises that were processed on my turf through my early herping years in Arizona. That's right, gentle readers, there was a time that I was a genuine tortoise researcher. I had my scientific permits, my carapace notching files, my datasheets, my mass-measuring scales, my ruler, my epoxy and my "license plates" all stuffed into my backpack with every field outing. And off I would go assailing every tortoise hapless enough to be in my path. There were many, and that is why I have an entire file drawer stuffed with datasheets. As I have not personally processed a tortoise since the year 2001, there has been no further need to open that drawer—until now.

We should address some of the finer nuances of the tortoises in the Tucson area before moving any further along with the narrative. The local clade has recently been reclassified as the Sonoran Desert Tortoise (*Gopherus morafkai*). There is a little nomenclature trick that I have adopted from the local researchers that combines the first two letters of the genus with the first two letters of the species for any given animal or plant species. Thus, instead of writing "Sonoran Desert Tortoise (*Gopherus morafkai*)" many times over in this column, I will simply use that little four-letter trick and call them "GOMO."

We should also mention before continuing that *nobody* loves GOMO more than I. There might be some who love them as much, but certainly not more. Throughout my formative years, I *always* kept at least one tortoise of one sort or another. And when I moved to Arizona, the fact that I was now in a place where I could find one in the wild on any given lucky day has never been taken for granted. I feel blessed and elated to live in a place that has them. By loving the local variety of tortoises in such fashion, I can be called a "GOMOphile." (Happily the genus name for our local tortoises is not *Homopus*. That might lead to a misunderstanding.)

The event that set up the explosive peak of my interest in wild populations of GOMO has already been documented in the March 1998 issue of the *Bulletin*. In order to avoid the risk of having hundreds of you injure yourselves in an all-out frenzy of closet-clearing effort seeking that issue, allow me to briefly describe some of the contents. In February of 1991, I was part of a gang of four who were involved with removing wild tortoises from the hillsides of a local mining corporation that was going to mow said hillsides down. Over time, we saved 17 different GOMO from certain death in the process, not to mention three Gila Monsters (*Heloderma suspectum*), or HESU, as those hillsides are now deep gorges. But on these outings, we were playing a simple game of find and remove. What was learned here was how to find a very cool herp. There have since been many variations of what to do with them when they *are* found.

During this period of time, GOMO was rapidly becoming the political football herp of the Tucson Valley. In short, there was money in GOMO studies. And that money not only kept every local wildlife biologist who favored herp projects gainfully employed, it pulled in many new faces from other states. Several of these wildlife biologists have since gone on to successful careers with GOMO-monitoring agencies as a result. Big shots they are now—and good on them, I say. Meanwhile, here was this author—fat, dumb and happy, finding *scads* of GOMO simply because he liked seeing them. In time, the pros and I connected. I shared my spots with them, and they shared not only their money with me (not a lot—but they didn't get all that much either), but also got me what I *really* wanted. And all that I *really* wanted was to be able to legally get my hands on tortoises, *really* get to know them, and mark some of them for future reference.

From 1993 through mid-1995, I often volunteered to assist the various researchers involved with GOMO work. In some cases, we were following radio-transmittered individuals around. In other cases, various grad students visited my spots with me, and processed some of the tortoises there. By summer of 1995, I got involved with three researchers who were working full time for the University of Arizona as freelance herpetologists. None of these three actually ever moved up the corporate ladder of GOMOdom, being instead content to move on to other things when the money ran out. It is out of respect for them that I mention them by name, for they were the first people who had enough trust and faith in me to get me a permit. They were Betsy Wirt, Peter Holm, and Brent Martin. Brent must have drawn the short straw between the three of them, for it was on 27 August that he went out with me to show me what was expected. After that, I was completely autonomous with my tortoise work. Every couple weeks, I copied my datasheets and handed them off to them. I only worked with this trio through 1995, but remained heavily involved with GOMO work for six years after that. That first summer of 1995, when I was working with them, was by far the most enjoyable.

For those unfamiliar with processing tortoises, a description of what is involved is in order. The first thing that must happen is to have the tortoise in hand. This is a pretty simple process when one finds one on the move across open ground. But it gets a lot more difficult if they are in a burrow. The deeper in the burrow that they are, the harder they are to remove. If I was able to touch them, I always succeeded in getting them out. If they were in beyond my reach, I left them alone—and came back later. Even though I was much leaner then, my size still limited me from going after the really deep ones (see Figure 1). Once in the hand, out came a stiff pair of calipers, used to measure length, width and height at various intervals along the carapace, dictated by the marginal and vertebral scutes on the carapace. Next came the mass measurement. I learned to use baling wire wrapped around the shell of the tortoise, the other end of the wire being affixed to a spring scale—much like those used by fishermen. Then came a triangular-shaped file, used to carve notches into the marginal scutes. Each marginal scute (or scale)

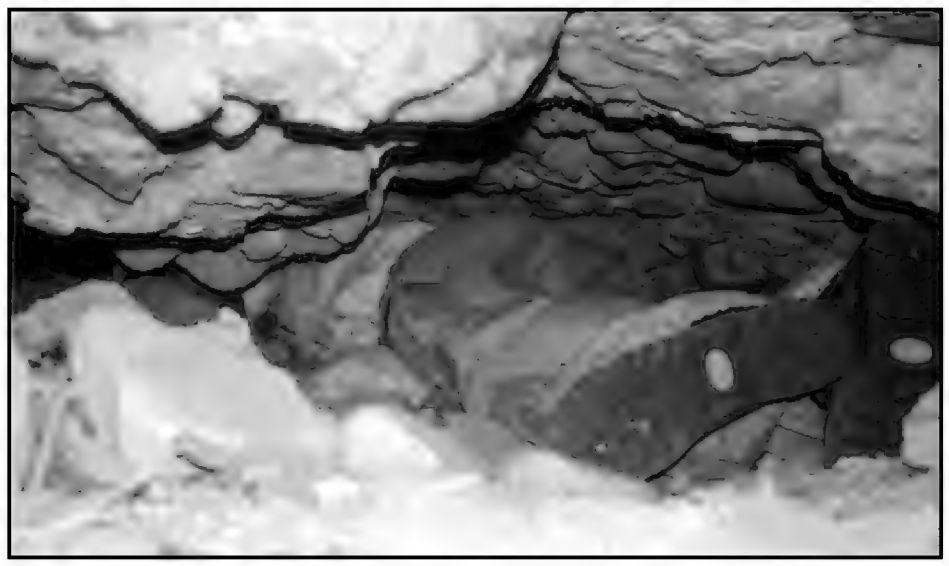


Figure 1. Gung-ho GOMOphile Taylor "Rudy the Rabbit" Edwards fearlessly demonstrates that tunnel-rat size is an advantage in going after the deep ones.

Figure 2. The Panther Peak Plot as viewed from afar. One hundred ten different tortoises were processed here in 1995, and many more in the years to follow. The area has been left in peace for over a decade now.

had a unique number assigned to it via any number of clever marking schemes developed by the mathematically inclined biologists. The last physical aspect of processing the tortoise was to epoxy a small, rectangular piece of index card to the rear-most vertebral scute, with the number inscribed by a magic marker. This was known as a "license plate." As these were the days before hand held GPS units were readily available, the location of the tortoise was marked on a contour map of the area being worked. Weather conditions and various temperatures were also recorded on a formal datasheet, along with any circumstances considered interesting by the observer. We will refer the reader to some titillating images of actual datasheets at the appropriate time in the text ahead.

As suggested earlier in the narrative, I basically handed some of my best GOMO turf over to the researchers. There was always a positive payoff to this practice. Many GOMO that I was watching wound up with a license plate and/or notched marginal scales, which made for much easier identification. The place that I showed Betsy, Peter, and Brent was one of my favorite stomping grounds, simply because it was absolutely *infested* with tortoises. The situation is ideal for GOMO. There exists a semi-circular ring of rugged peaks that form the rim of a massive, natural half-bowl. The slopes of the peaks along the rim of this half-bowl are south and west-facing, so they gather sunlight for most of the day. This becomes important in winter, as that is where the majority of the GOMO head during that time period. The soil that marches roughly mid-way up the steep slopes is cluttered with boulders great and small. Cutting through the bowl below the hillsides are a series of deep, steep-walled arroyos, the embankments of which are pockmarked with holes and mini-caves. This is where the GOMO go in the summer and fall. There were so many tortoises in these arroyos that Betsy was at first against adopting the place, as she feared the burgeoning population there would reflect a biased and lopsided scorecard compared to normal patches of tortoise turf. But Peter and Brent wanted *lots* of tortoises, and talked Betsy into accepting the place. The Panther Peak Plot, as it would one day be named, yielded 110 different GOMO in just a one-year timeframe (Figure 2). Throughout the remainder of the century, and on into Y2K, it became the playground for many up-and-coming tortoise Jedis.

Enough! The previous verbiage was all a sweet set-up for what happened at Panther Peak Plot on 1 October 1995. As we begin the transition together to the actual event, we must first go one more step in the set-up by asking you *all* one long question. We have a young and extremely jacked up Roger Repp, fully armed with scientific processing equipment, in the thick of a place that he knows is the best GOMO spot ever, on a mission to seek and mess with any GOMO found—what ***could*** happen? Since you *all* have just endured the long set-up, I will just tell you now that I heard a thump, which led me to the ending of a Genuine Gung-ho GOMO Guys' brawl. The victor had his left-front, elephantine-club of a foot planted on top of his upended, vanquished foe, hooking his opponent's left front leg in the process and pinning him *helplessly* to the ground. Seeing the victor of this contest was where the first notion of "where the turtles are strong" came from. The camera that I carried at the time was little more than a crappy Instamatic loaded with 35 mm slide film. But once every hundred or so times, a passable image would accidently occur. The first image taken of the battle's aftermath is not only passable, but remains the best image of GOMO combat ever to pass before my eyes (see cover of this issue, and for another angle, Figure 3). Indeed, when some of the local tortoise nerds saw this image, they accused me of posing it! *That* would take some doing—and I have *never* had that sort of patience. No, this photo opportunity, as well as the subsequent images, were simply the result of more luck than brains.

But at this point in the observation, the "fun" was just beginning. It was now time for the Gung-ho GOMOphile to mess with the dueling Gung-ho GOMO Guys. I am pleased to report that the victor was not touched, as I had processed him the week

Figure 3. Top view of the end of the fight.

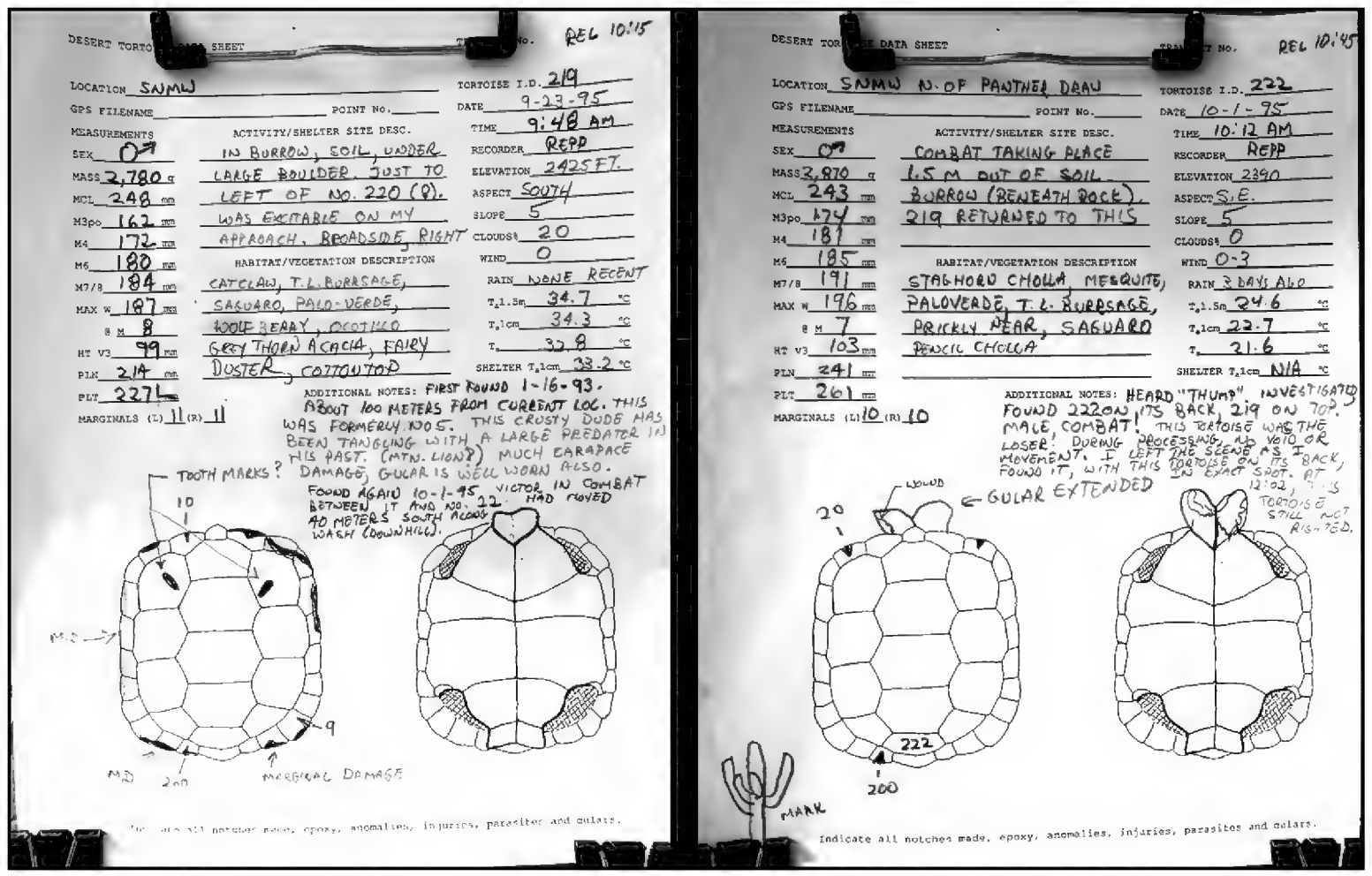

DESERT TORTOISE DATA SHEET
REL 10:15
LOCATION SNMW
TORTOISE I.D. 219
DATE 9-23-95
TIME 9:48 AM
RECORDER REPP
ELEVATION 2425 FT.
ASPECT SOUTH
SLOPE 5
CLOUDS% 20
WIND 0
RAIN NONE RECENT
SHELTER T,1cm 33.2 °C
SEX ♂
MASS 2,780 g
MCL 248 mm
M3po 162 mm
M4 172 mm
M6 180 mm
M7/8 184 mm
MAX W 187 mm
@ M 8
HT V3 99 mm
PLN 214 mm
PLT 227 mm
MARGINALS (L) 11 (R) 11
ACTIVITY/SHELTER SITE DESC.
IN BURROW, SOIL, UNDER LARGE BOULDER. JUST TO LEFT OF NO. 220 (8). WAS EXCITABLE ON MY APPROACH. BROADSIDE, RIGHT
HABITAT/VEGETATION DESCRIPTION
CATCLAW, T.L. BURRSAGE, SAGUARO, PALO-VERDE, WOLFBERRY, OCOTILLO GREY THORN ACACIA, FAIRY DUSTER, COTTONTOP
ADDITIONAL NOTES: FIRST FOUND 1-16-93. ABOUT 100 METERS FROM CURRENT LOC. THIS WAS FORMERLY NO 5. THIS CRUSTY DUDE HAS BEEN TANGLING WITH A LARGE PREDATOR IN HIS PAST. (MTN. LION?) MUCH CARAPACE DAMAGE, GULAR IS WELL WORN ALSO. FOUND AGAIN 10-1-95, VICTOR IN COMBAT WITH NO. 222. HAD MOVED ABOUT 40 METERS SOUTH ALONG WASH (DOWNHILL).
TOOTH MARKS?
10
M.D.
2nd
9
MARGINAL DAMAGE
Indicate all notches made, epoxy, anomalies, injuries, parasites and gulars.
DESERT TORTOISE DATA SHEET
REL 10:45
LOCATION SNMW N. OF PANTHER DRAW
TORTOISE I.D. 222
DATE 10-1-95
TIME 10:12 AM
RECORDER REPP
ELEVATION 2390
ASPECT S.E.
SLOPE 5
CLOUDS% 0
WIND 0-3
RAIN 3 DAYS AGO
SHELTER T,1cm N/A
SEX ♂
MASS 2,870 g
MCL 243 mm
M3po 174 mm
M4 181 mm
M6 185 mm
M7/8 191 mm
MAX W 196 mm
@ M 7
HT V3 103 mm
PLN 241 mm
PLT 261 mm
MARGINALS (L) 10 (R) 10
ACTIVITY/SHELTER SITE DESC.
COMBAT TAKING PLACE 1.5 M OUT OF SOIL BURROW (BENEATH ROCK). 219 RETURNED TO THIS
HABITAT/VEGETATION DESCRIPTION
STAGHORN CHOLLA, MESQUITE, PALOVERDE, T.L. BURRSAGE, PRICKLY PEAR, SAGUARO PENCIL CHOLLA
ADDITIONAL NOTES: HEARD "THUMP". INVESTIGATED FOUND 222 ON ITS BACK, 219 ON TOP. MALE, COMBAT! THIS TORTOISE WAS THE LOSER! DURING PROCESSING, NO VOID OR MOVEMENT. I LEFT THE SCENE AS I FOUND IT, WITH THIS TORTOISE ON ITS BACK, IN EXACT SPOT. AT 12:02, THIS TORTOISE STILL NOT RIGHTED.
GULAR EXTENDED
20
222
200
MARK
Indicate all notches made, epoxy, anomalies, injuries, parasites and gulars.

Figure 4. Datasheets for the participants of the combat described in the text. The winner, #219, "Lion Bait," is on the left, and the loser, #222, is on the right. All things considered, their sizes are similar, but #219 had the advantage of experience. Lion Bait was one spunky old dude!

previous. But for the vanquished, well, we can just say that it wasn't his day. "Lion Bait," as we shall henceforth call the winner of the bout, backed off the scene after remaining frozen for many images. He turned his back to me and slowly ambled off to a perfect soil burrow under a boulder roughly 1.5 meters north of the epicenter of the battle's conclusion. He likely knew what might be coming next, as we had already met. Hence, he sought the closest safe shelter to hunker down, and remained there unmolested and well-behaved. It should be mentioned here that if there was a female near the scene to trigger the trouble, she could have easily been behind Lion Bait in the burrow. I was deeply respectful of Lion Bait, and never got close enough to that burrow to look behind him. (In retrospect, that was rather stupid of me, but that is all history now.)

Meanwhile, I must try to grope upward in the intelligence department so that I can relay to you what it was like to be the vanquished GOMO on this miserable day of his. We shall call him "Bad Day," as "Loser" seems a bit harsh. Here's my take of what Bad Day was thinking at the point that I entered the scene: "Okay, I just got my ass kicked, and this *jerk* has me nailed to the ground. It's hot here. This day can't get any worse, right?" Bad Day stoically endures the most humiliating moments of the ass-kicking in silent depression, and then his brain wakes up when there is suddenly a change to the situation. "Wow—he's getting off me? Cool! Thank you, kind sir. But waitaminute! Here's another jerk! A really big one! What's up around here? One jerk leaves, a bigger jerk arrives? What's he doing now? Oh no, is he going to mess with me? He *is* going to mess with me! He's touching me, whoa, he's got me, is he going to eat me now? Wee, that tickles--no, what's this? Ouch—*stop it*!" And then one long 33 minute in duration: "GAAA, no, please . . . no . . . no, not *that*—GAAAAAAAAAA!"

Bad Day kept these thoughts to himself. He mercifully remained frozen in the shell for all that followed. My mighty N of one with processing a losing participant in GOMO combat would lead me to believe that they are ready to be compliant. He did not void during processing—always considered a plus. When I finished with Bad Day, I was faced with a bit of a dilemma. Put him back as found, or leave him with his feet on the ground? As suggested earlier, this was not his day. I left him in the exact spot and situation that he was found. I was confident that he could flip himself over at will. Said confidence was seriously shaken when I returned roughly two hours later. Lion Bait was halfway between the burrow and his still overturned opponent, facing him, and clearly moving toward him. I turned my back to the scene, and left poor Bad Day for dead. My reason for leaving him upside down is because I didn't want the rightful victor of this contest to have to fight again—and possibly lose. What happened before I got there was meant to happen, and any meddling after that was messing with what nature had ordained. But I must confess that I did not sleep well for several nights after. The first report that 222 was still alive came in from the UA gang the week following. This news was *most* welcome! Please refer to the datasheets in Figure 4. Allow me to just pick off a few highlights, so we can keep the caption brief. Lion Bait is on the left, Bad Day on the right. The image/datasheets also give the actual numbers of #219 for Lion Bait, and #222 for Bad Day. It should be mentioned that, as noted on the datasheet, Lion Bait and I first met on 16 January 1993. At that time, he was overwintering upslope of this observation, and was the fifth GOMO found in the area. I was not marking tortoises at that time, but a large carnivore of some sort—presumably a mountain lion, had marked him for me. Hence the name "Lion Bait." I hope that lion had permits! The datasheets, images, and observer experience agree that Bad Day is a much younger GOMO than Lion Bait. The younger GOMO also outweighs the older. The youngster has a much more pronounced gular, which is the crowbar-shaped bony prominence that projects outward under the plastron just below the throat. His gular should have given

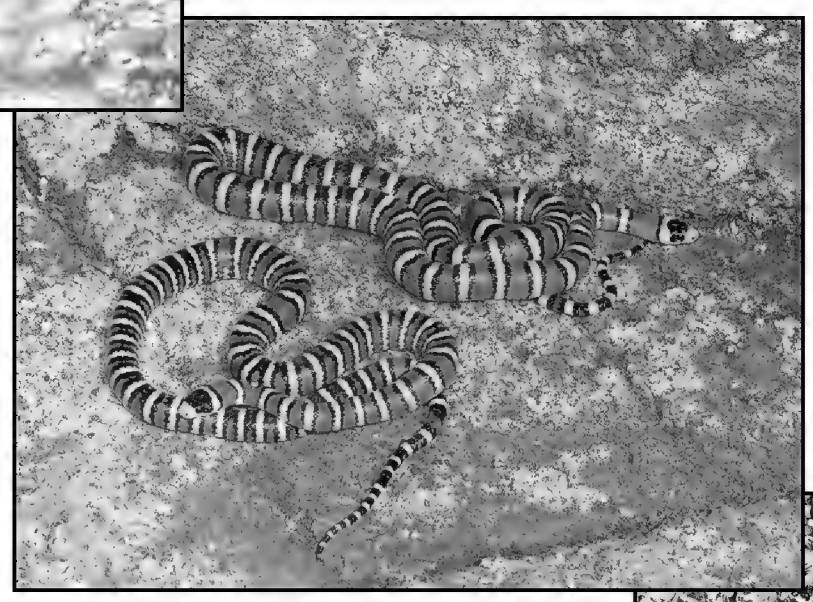
him an advantage, as Lion Bait had only a nub of a gular left to fight with. Lion Bait was a tad longer in carapace length, but otherwise, the size of the participants was nearly equal. As soon as I relayed this info to Betsy, she told me that everything she had read and heard indicated that in such cases as this, the older, more experienced tortoise almost universally wins. Did you hear that, young sprouts? Old age and treachery always trumps youth and skill. Keep your wits about you before you go messing with any old guys, lest you get the surprise of your lives!

In closing, it should be added this was *not* a long, knock-down, drag out fight. My own summation of the situation is that it was one highly audible "whump" and done. The blow was likely delivered by a head-on crash initiated by the old guy, who was no doubt charging downslope at top speed to hit that youngster. He likely knocked his younger counterpart head over heels in the process, and quickly maneuvered to pin him. When this lone thump was heard, I was moving down a deep cut, and was already serendipitously moving straight for it as it happened. It was a *thunderously* loud "whump"—as if somebody raised a five-pound boulder above their head and slammed it to the ground. Had there been any sparring, I would have heard a sound similar to two coconuts being slammed against each other several times. I have been close to GOMO battles on two other occasions, but also completely missed the sparring action both times. It is my opinion that with the Sonoran Desert variety of tortoises, combat is not a common occurrence. Nevertheless, as one who is always seeking cool, it is my earnest hope to one day photograph the coolest of the cool: an all out slugfest between two equally sized male GOMO. Hey—it *could* happen!

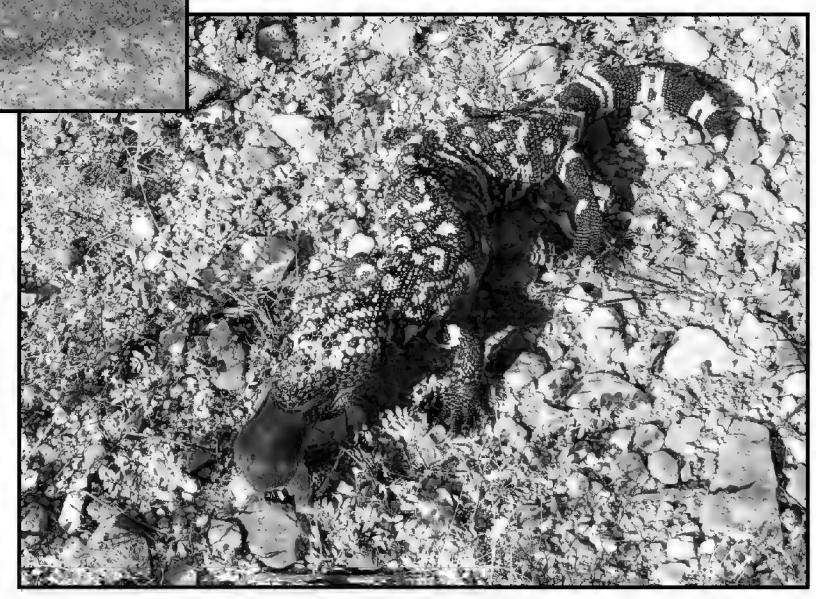
This author is pleased to report that while a few long-term monitoring plots still remain in this state, the overwhelming attention that the local tortoises once received has died down. To my knowledge, the last of the mass outings to the Panther Peak Plot stopped in 2003. I consider this a good thing. We now know how big they get, where they go, what they eat, when they reach sexual maturity, fight and mate, where, when and how they nest. All the attention that they got for the ten-year time span under discussion was a form of loving them to death. As I pack my datasheets back into the file drawer from whence they came, I have arrived at the realization that the best way to conserve GOMO is to just leave them the hell alone. They are doing fine without our "help." This is how I know that *nobody* loves them more than I. There isn't enough money in the world to interest me in further disturbing them for any purpose—scientific or otherwise. I have made my peace with them, and will keep all future admiration at a distance.

This here is Roger Repp, signing off from Southern Arizona, where . . .

the turtles are strong,



the snakes are handsome,



and the lizards are all above average.

Herpetology 2017

In this column the editorial staff presents short abstracts of herpetological articles we have found of interest. This is not an attempt to summarize all of the research papers being published; it is an attempt to increase the reader's awareness of what herpetologists have been doing and publishing. The editor assumes full responsibility for any errors or misleading statements.

NEW SPECIES OF DWARF ALLIGATOR LIZARD

J. Banda-Leal et al. [2017, Journal of Herpetology 51(2): 223-226] describe *Gerrhonotus lazcanoi*, a new species of smooth-scaled anguid from arid northern foothills of the Sierra Madre Oriental in Nuevo León, Mexico. This new species is similar to the other smooth-scaled gerrhonotines: *Gerrhonotus lugoi* McCoy, 1970, from the Cuatrociénegas Basin of Coahuila; *G. parvus* Knight and Scudday, 1985, from the Sierra Madre Oriental in Nuevo León; and *G. farri* Bryson and Graham, 2010, from the Sierra Madre Oriental in Tamaulipas. It differs from these species in several important morphological characters, including number of postrostral scales, postoculars, postmentals, sublabials, and dorsal and ventral scale rows. It also is the only known anguid to possess three postmentals and a novel azygous scale between the postmentals and the gular shields. The new species is named in honor of Dr. David Lazcano, a frequent contributor to the CHS *Bulletin*.

COMPETITION IN A SALAMANDER COMMUNITY

E. A. Dallalio et al. [2017, Journal of Herpetology 51(2): 190-196] note thar the distribution of the federally endangered Shenandoah salamander (*Plethodon shenandoah*) is presumed to be limited by competition with the red-backed salamander (*Plethodon cinereus*). In particular, the current distribution of *P. shenandoah* is understood to be restricted to warmer and drier habitats because of interspecific interactions. These habitats may be particularly sensitive to climate change, though the influence of competition may also be affected by temperature and relative humidity. The authors investigated the response of *P. shenandoah* to competition with *P. cinereus* under four climate scenarios in 3-dimensional mesocosms. The results suggest that, although climate change may alleviate competitive pressure from *P. cinereus*, warmer temperatures may also significantly influence the persistence of the species across its known range.

RESPONSES TO PCB CONTAMINATION

J. P. Gibbs et al. [2017, Journal of Herpetology 51(2):209-214] note that a major challenge in amphibian ecotoxicology is understanding the population-level implications of laboratory-based, dose-response studies. The authors contrasted habitat occupancy among five species of frogs and toads in two adjacent segments of the upper Hudson River—one heavily contaminated by polychlorinated biphenyls (PCBs, compounds reported to have adverse impacts on individual amphibians) and the other uncontaminated—while controlling for site and sampling covariates. Site occupancy was estimated via repeated call surveys at 40 wetland sites during 2006 and 2007. Habitat occupancy varied strongly in response to whether breeding sites were hydrologically connected to the Hudson River but was independent of the degree of PCB contamination of a given river segment. The results highlight the uncertainties of extrapolating outcomes of laboratory-based, toxicological studies to wild amphibian populations.

MANAGING A THREATENED FROG SPECIES

M. J. Lannoo et al. [2017, Copeia 103(1):53-63] used a variety of techniques to track dispersing juvenile and migrating adult crawfish frogs (*Lithobates areolatus*) to determine how these movements produce the relatively high degree of interconnectivity previously found among breeding wetlands at Hillenbrand Fish and Wildlife Area-West (HFWA-W) in southwestern Indiana. The authors found that newly metamorphosed juveniles disperse in all directions, with average daily movements between 27 m (2015) and 35 m (2011) and maximum daily movements of 114 m (2011) and 297 m (2015). When placed in artificial burrows, juveniles tended to abandon them in order to continue dispersing. Of the 196 juveniles produced at Nate's Pond and subsequently captured as breeding adults, 141 (71.9%) returned to Nate's; the remainder dispersed to five other breeding wetlands, including one that was 1.35 km away. Adults were also vagile. At Nate's, only 137 (50.6%) of the 271 adults that bred there from 2012–2016 were produced there. Further, of the 255 crawfish frog adults breeding at least twice, 57 (22.4%) were captured at different wetlands. As a component of a comprehensive management plan that considers juvenile crawfish frogs, the authors suggest minimizing summertime aboveground disturbance through the use of mowers, all-terrain vehicles, trucks, and heavy equipment. Plowed areas such as food plots should be narrow and placed in a radial pattern in relation to breeding wetlands to preclude juveniles crossing tangentially oriented areas of bare ground, which expose them to predators.

GRAY TREEFROG OVIPOSITION PREFERENCES

M. R. Pintar and W. J. Resetarits, Jr. [2017, Journal of Herpetology 51(2):186-189], note that oviposition site selection by breeding amphibians determines larval habitat for their offspring. Many amphibians breed in temporary ponds, which vary in hydroperiod and levels of competition, predation, and resource abundance. Newly filled ponds have fewer competitors and predators and more periphyton and phytoplankton, which are more palatable food sources for anuran larvae. The authors tested for oviposition site preference between old and new water pools in *Hyla chrysoscelis*, a species known to have better larval performance in newly filled pools. Consistent with larval performance and the observation that anurans often breed in ponds immediately after they fill, *H. chrysoscelis* selectively oviposited in new pools. Conductivity was significantly lower and dissolved oxygen significantly higher in new versus old pools, and these may be cues of pond age and productivity, respectively. This study demonstrates that adult oviposition site selection preferences match larval performance differences seen in previous work and that this preference is not simply for newly filled ponds but for ponds with a recent influx of water. These results suggest novel ways for land managers to increase amphibian populations. Draining ponds will increase their attractiveness to breeding females who simultaneously avoid fish and choose new water.

NOVEL EGGSHELL

R. M. Andrews [2017, Journal of Herpetology 51(2):173-177] notes that most lizards and snakes lay flexible-shelled eggs with high water vapor permeability and which absorb water during incubation and increase in mass, volume, and surface area (water uptake is necessary for successful embryonic development). In contrast, one clade of gekkotans lay rigid-shelled eggs with low permeability which, like bird eggs, lose water during incubation and incubate successfully under low moisture conditions. Anecdotal accounts suggest that eggs of some New Caledonian diplodactylids, a family of gekkotans characterized by flexible-shelled eggs, are "hard-shelled." The author made observations on the eggs of *Correlophus ciliatus* (= *Rhacodactylus ciliatus*) to test the idea that New Caledonian diplodactylid eggs exhibit features unlike those of other squamates that lay flexible-shelled eggs. He found that *C. ciliatus* eggs are flexible-shelled; they have relatively high water vapor permeability and they increase in mass during incubation as the result of water uptake. Nonetheless, egg characteristics fall outside the range of values observed for squamates that lay flexible-shelled eggs. While *C. ciliatus* eggs increase in mass (as expected of flexible-shelled eggs), the magnitude of increase is substantially lower than in eggs of other squamates. Moreover, water vapor permeability of *C. ciliatus* eggs is about 40% that of flexible-shelled eggs of the same mass. Therefore, shell characteristics appear to be transitional between flexible- and rigid-shelled eggs. This suggests that the diplodactylid geckos of New Caledonia may provide a unique opportunity to explore the nature of the evolutionary transition between two disparate shell types.

AMERICAN ALLIGATOR GROWTH PATTERNS

P. M. Wilkinson et al. [2016, Copeia 104(4):843-852] note that the perception that crocodilians exhibit indeterminate growth is common in the general reptilian literature. However, this assumption is frequently based on observations of immature and young adult animals and therefore lacks a complete understanding of adult growth patterns. Long-term mark-recapture studies appear to be the most certain method of determining growth patterns of adult crocodilians. From 1979 to 2015, the authors conducted a mark-recapture study of an American alligator (*Alligator mississippiensis*) population on the Tom Yawkey Wildlife Center (YWC) in coastal South Carolina to examine long-term growth patterns and the influence of age on multiple reproductive parameters. No discernible linear growth was found in 19 of 31 adult female and 7 of 19 adult male alligators over periods of 5–33 years. The mean maximum reproductive lifespan for female alligators on the study site was 46 years, and females continued to reproduce for an extended period of time after reaching maximum size. The Schnute growth model predicted that male alligators grew at a faster rate and attained a greater estimated mean terminal snout–vent length (SVL) than females (males = 186.9 cm; females = 135.9 cm) at the hypothetical age 75. In addition, the model predicted that males exhibited a greater estimated mean size (SVL = 182.0 cm) and age (43 years) at which growth essentially ceased when compared to females (SVL = 131.4 cm; 31 years). However, actual growth records of individual alligators suggested that the growth model may have overestimated the age at which male alligator growth ceased. The estimated mean earliest age at sexual maturity was 11.6 years for males and 15.8 years for females. The study also documented that alligators on the site commonly live to 50 and possibly to >70 years of age. This study provides evidence that both male and female American alligators in a population in coastal South Carolina exhibit a pattern of determinate growth and adds to a growing list of studies suggesting crocodilians as a group exhibit this growth pattern rather than indeterminate growth. These findings are important for modeling population growth and determining sustainable harvest rates, particularly for alligators living near their northern distributional limit where growing seasons may be shorter and onset of sexual maturity later than in more southern portions of their range.

TUATARA SCENT DISCRIMINATION

N. C. Wu and J. R. Waas [2017, Journal of Herpetology 51(2): 178-185] note that chemically mediated interactions are an important component of reptile life. Tuatara (*Sphenodon punctatus*) have been documented to locate prey by olfaction, and the recent discovery of a cloacal gland secretion (tuataric acid) suggests chemicals may be used as social signals. Social discrimination of recognized tuatara populations (i.e., Cook Strait and northern versus Brothers) via chemosensory means has yet to be determined. To explore whether tuatara react to cloacal gland odors or respond differently to the odor of a different population, three response variables were measured within 60 cm and 30 cm of a scent source within a captive colony: 1) time of first approach; 2) total number of approaches; and 3) total time. Ten male Cook Strait tuatara were sequentially presented with three treatments: control (distilled water); male North Brother odor; and male Cook Strait odor. Although no significant differences in response were detected across odors and the control, on average, cloacal gland secretions were investigated faster, more often, and for longer than the water control. Further, four of the 10 test subjects made physical contact with the treatment containers when they contained cloacal gland secretions—this never occurred under control conditions. Although preliminary, this study provides insight into the potential role of chemical signals in tuatara.

PIG-NOSED TURTLE VOCALIZATIONS

C. R. Ferrara et al. [2017, Copeia 105(1):29-32] note that recent research has demonstrated that some freshwater turtles vocalize underwater, but the taxonomic breadth of this mode of communication in freshwater turtles is unknown, hindering understanding of its evolution. The pig-nosed turtle (*Carettochelys insculpta*), a monotypic genus inhabiting tropical Australia and New Guinea, is a likely candidate for producing underwater sounds because it exhibits social behavior while feeding, nesting, and thermoregulating. Using an omnidirectional hydrophone, the authors tested the hypothesis that *C. insculpta* vocalizes. They recorded *C. insculpta* emitting sounds underwater in the field and in captivity in northern Australia in May 2014. Analysis revealed that the 182 sounds produced by seven individuals could be separated into three sound categories. The sounds were simple and characteristic of a contact call, and were similar to those recently reported in other species of aquatic turtles. Further research should focus on the role of sound production in social activities.

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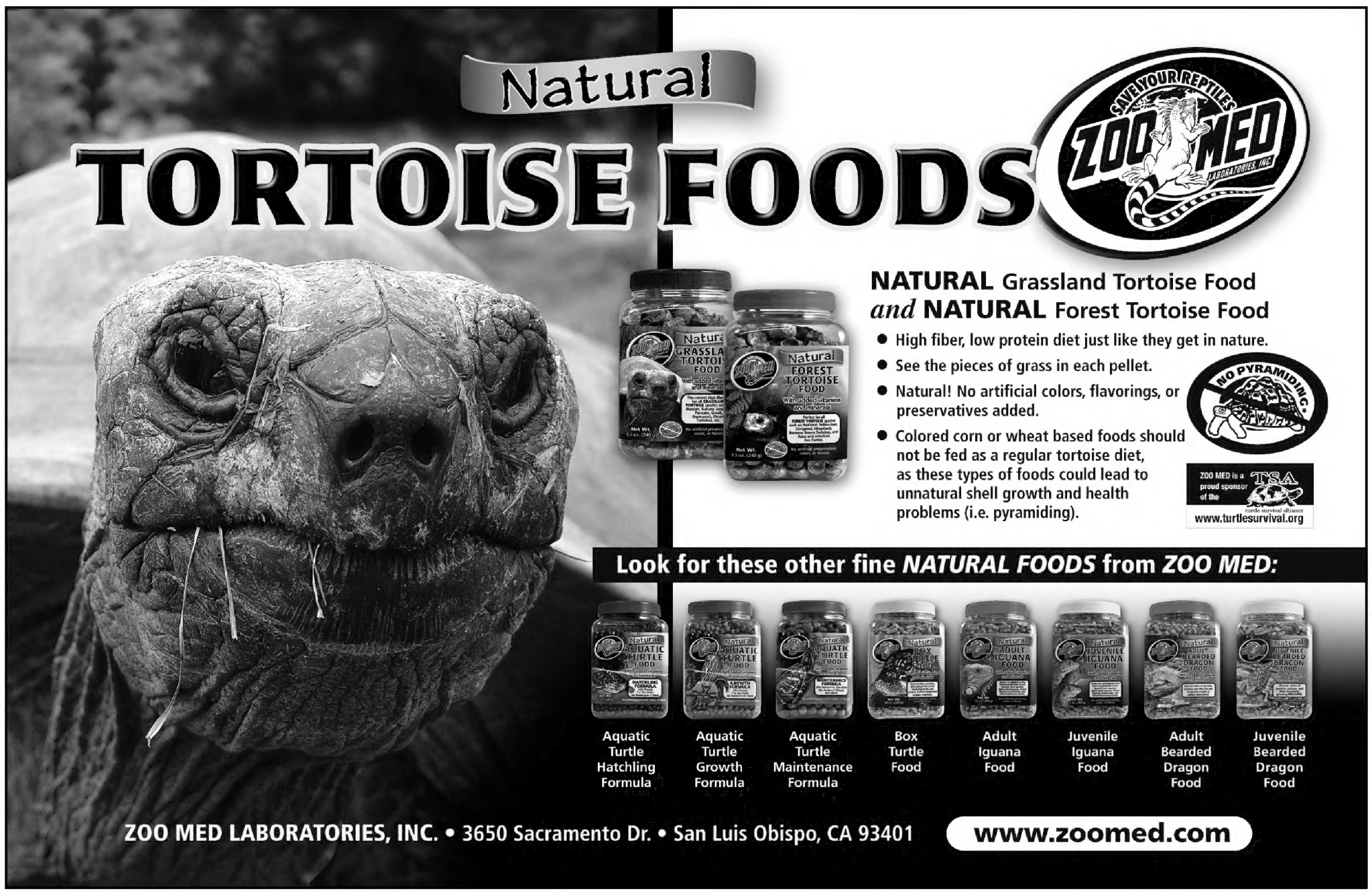
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Minutes of the CHS Board Meeting, April 14, 2017

President Rich Crowley called the meeting to order at 7:30 P.M. Board members Lisette Chapa and Jessica Wadleigh were absent. The minutes of the March 17 board meeting were read and accepted with changes.

Officers' Reports

Treasurer: Andy Malawy went over the March financial report.

Membership secretary: Mike Dloogatch read the list of expiring memberships.

Media secretary: The board agreed that the recipients of the 2016 CHS awards should be listed in the *Bulletin*.

Sergeant-at-arms: Attendance at the March 29 general meeting was 34.

Committees

Shows: Dick Buchholz read through the list of upcoming shows.

Jr. Herpers: Frank Sladek did a great job on a TV spot. At the last meeting the junior members were out in the museum giving talks about the museum collections.

Nominating: Kim Klisiak volunteered to chair the committee to come up with the slate for 2018. Board members John Bellah and Mike Scott volunteered; two additional non-board members must be added to fill out the committee.

ReptileFest: The board offered a big thank-you to John Archer. John replied with a big thanks to everyone who stayed to help with tear-down. Fewer members exhibited this year. Kim Klisiak did an excellent job on the t-shirts. At the last minute we learned that the tables were 8' not 6'. The Bavirshas had to redo the entire table layout on Thursday night. Andy reviewed preliminary 'Fest numbers. John emphasized that we must have a new chairperson for 'Fest next year. We also must have a backup venue option as leverage against any price increases: 35–40,000 sq. ft., easy accessibility.

New Business

Mike Dloogatch moved that we attempt to sell the CHS trailer. Dan Bavirsha seconded, and the motion carried unanimously.

The meeting adjourned at 9:20 P.M.

Respectfully submitted by recording secretary Gail Oomens

SHOW SCHEDULE

In addition to ReptileFest the Chicago Herpetological Society puts on many live animal displays throughout the year. The events now scheduled for June through August are listed below. CHS members who wish to participate in an event should call or text ahead to Show Coordinator Dick Buchholz, 805-296-9516, to confirm.

- Notebaert Nature Museum, first full weekend of each month, Saturday and Sunday, 10 A.M. – 3 P.M.
- All Animal Expo, first Saturday & third Sunday of each month, 10 A.M. – 3 P.M., Dupage County Fairgrounds, Wheaton.
- Aurora GreenFest, June 10, 10 A.M. – 3 P.M., Prisco Community Center, 150 W Illinois, Aurora.
- Cold Blooded Expos Reptile Show, June 11, 10 A.M. – 3 P.M., Midwest Conference Center, 401 W Lake St, Northlake.
- Raging Waves Waterpark, June 17, 10 A.M. – 6 P.M., 4000 Bridge St, Yorkville.
- Rockin' for Reptiles, June 24, Midwest Museum of Natural History, Sycamore.
- Greek Festival, June 24–25, 3 P.M. – 9 P.M., St. Nectarios Greek Orthodox Church, 133 S Roselle Rd, Palatine.
- Greek Festival, July 8–9, 3 P.M. – 9 P.M., St. Andrews Greek Orthodox Church, 5649 N Sheridan Rd., Chicago.
- MSI Members Night, July 19, 5:30 P.M. – 9 P.M., Museum of Science and Industry, Chicago.
- Sheffield Garden Walk, July 22–23, Noon – 9 P.M., Sheffield & Webster, Chicago.
- Raging Waves Waterpark, July 29–30, 10 A.M. – 7 P.M., 4000 Bridge St, Yorkville.
- Back to School Fair, August 12, 10 A.M. – 3 P.M., First Christian Church, Downers Grove.
- Raging Waves Waterpark, August 13, 10 A.M. – 6 P.M., 4000 Bridge St, Yorkville.
- BugFest, August 19, 9 A.M. – 2 P.M., Red Oak Nature Center, 2343 S River St, Batavia.

UPCOMING MEETINGS

The next meeting of the Chicago Herpetological Society will be held at 7:30 P.M., Wednesday, May 31, at the Peggy Notebaert Nature Museum, Cannon Drive and Fullerton Parkway, in Chicago. **Dr. David Steen**, an assistant research professor in the Department of Biological Sciences at Auburn University, will speak about two lines of research he has pursued over the last few years. These include a) the large scale habitat preferences of upland snakes and examining how their interactions as competitors and as predator/prey influence their persistence, and b) novel threats facing freshwater turtle populations through increased mortality of adults, including road mortality and fishhook ingestion. Snakes and turtles can occur in species-rich assemblages; this makes them useful for examining ecological interactions that promote co-existence as well as determining natural history traits that make them susceptible to conservation threats; however, these animals are generally overlooked in both ecological and conservation studies.

The June 28 meeting will be our popular and always well-attended annual **Show & Tell** meeting. Bring an animal that you find interesting for one reason or another and be prepared to give a short (under five minutes) presentation to the group. Don't be shy. Neither age (yours) nor commonness (the animal's) should be a limitation.

The regular monthly meetings of the Chicago Herpetological Society take place at Chicago's newest museum—the **Peggy Notebaert Nature Museum**. This beautiful building is at Fullerton Parkway and Cannon Drive, directly across Fullerton from the Lincoln Park Zoo. Meetings are held the last Wednesday of each month, from 7:30 P.M. through 9:30 P.M. Parking is free on Cannon Drive. A plethora of CTA buses stop nearby.

Board of Directors Meeting

Are you interested in how the decisions are made that determine how the Chicago Herpetological Society runs? And would you like to have input into those decisions? If so, mark your calendar for the next board meeting, to be held at 7:30 P.M., Friday, June 16, 2017, at the Schaumburg Township District Library, 130 S. Roselle Road, Schaumburg.

The Chicago Turtle Club

The monthly meetings of the Chicago Turtle Club are informal; questions, children and animals are welcome. Meetings normally take place at the North Park Village Nature Center, 5801 N. Pulaski, in Chicago. Parking is free. For more info visit the group's Facebook page.

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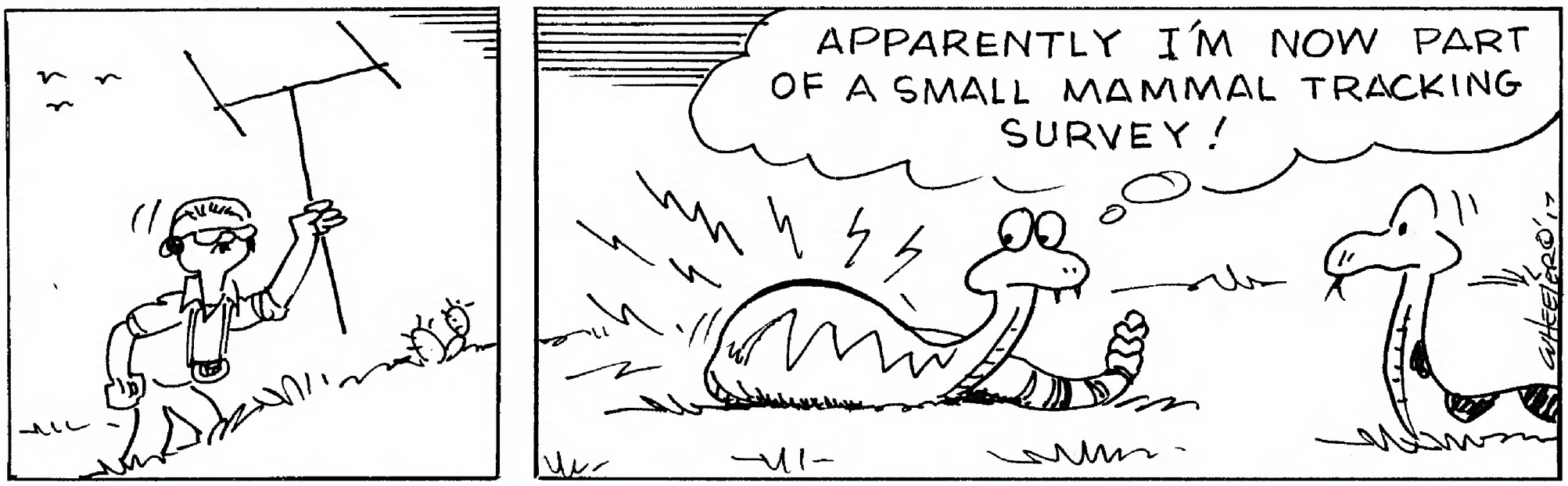

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